

IN THE CLAIMS

1. (Original) In a communication system in which users communicate through a switched telephone network, a private communication network for facilitating communication among a plurality of member user telephone sets said private communication network comprising:

a network call manager including:

a telephone network interface for establishing a telephone connection with each of said plurality of member users over a plurality of channels of said switched telephone network, respectively,

a switch matrix, coupled to said telephone network interface, for providing an information signal received by said telephone network interface over one of said plurality of channels simultaneously to a plurality of others of said channels via said telephone network interface, and

a controller for configuring said switch matrix in response to talk request signals received over a selected one of said plurality of channels; and

a plurality of eligible member user telephone sets disposed for simultaneous communication over said plurality of channels, each of said eligible member user telephones sets including means for generating one of said talk request signals, at least some of said eligible member user telephone sets being connected to the private communication network through a wireless communications system.

2. (Original) The private communication network of claim 1 wherein said controller means including means for identifying said selected one of said plurality of channels by choosing among ones of said talk request signals received over corresponding ones of said plurality of channels.

3. (Original) The private communication network of claim 1 wherein a selected one of said plurality of authorized telephone sets includes:

vocoder means for digitally processing input information in order to produce a sequence of vocoder data packets, and

modem means for generating said information signal using said vocoder data packets.

4. (Original) The private communication network of claim 3 wherein said modem means includes means for multiplexing said talk request signal with said vocoder data packets and for using the result during formation of said information signal.

5. (Original) The private communication network of claim 1 wherein said controller means includes means for verifying that said information signal received over said selected one of said plurality of channels was generated by a given one of said plurality of authorized telephone sets.

6. (Original) The private communication network of claim 5 wherein said controller means includes means for configuring said telephone network interface to call other ones of said authorized telephone sets subsequent to receipt by said network call manager of said information signal from said given one of said plurality authorized telephone sets.

7. (Original) The private communication network of claim 1 further including wireless network means for operatively coupling one of said plurality of authorized telephone sets to a corresponding one of said plurality of channels.

8. (Original) The private communication network of claim 1 wherein each of said plurality of authorized telephone set includes means for generating an encrypted signal by encrypting an information signal provided by one of said member users, said encrypted signal being transmitted over a corresponding one of said plurality of channels.

9. (Original) The private communication network of claim 8 wherein each of said plurality of authorized telephone sets includes means for recovering one of said information signals from one of said encrypted signals transmitted over a corresponding one of said channels.

10. (Original) In a communication system in which users communicate through a switched telephone network, a network call manager for facilitating private communication

simultaneously among a plurality of member user telephone sets, at least some of said member user telephone sets being connected to the private communication network through a wireless communications system, said network call manager comprising:

a telephone network interface for establishing a telephone connection with each of a plurality of said member user telephone sets, including at least a plurality of said member user telephone sets that are connected to the private communication network through the wireless communications system, over a corresponding plurality of channels of said switched telephone network;

a switch matrix, coupled to said telephone network interface, for providing an information signal received over a selected one of said plurality of channels simultaneously to other ones of said plurality of channels via said telephone network interface; and

controller means for configuring said switch matrix in response to control information received over at least one of said plurality of channels.

11. (Original) The network call manager of claim 10 wherein said controller means includes a controller for selecting said selected one of said plurality of channels in response to a talk request signal received over said selected one of said plurality of channels.

12. (Original) The network call manager of claim 11 further including wireless network means for establishing communication between at least one of said member users and said switched telephone network.

13. (Original) The network call manager of claim 12 wherein said controller means includes arbitration means for choosing said selected one of said plurality of channels on the basis of talk request signals received from ones of said member users over corresponding ones of said plurality of channels.

14. (Original) The network call manager of claim 13 wherein said controller means includes means for informing ones of said member users via corresponding ones of said plurality of channels of the identity of a selected member user providing said information signal over said selected one of said plurality of channels.

15. (Original) The network call manager of claim 14 wherein said controller means includes means for informing at least one of said member users via a corresponding one of said plurality of channels of the identities of ones of said member users associated with corresponding ones of said plurality of channels.

16. (Original) In a private communication network system in which users communicate through a switched telephone network, a method for facilitating private communication among a plurality of eligible member user telephone sets, at least some of said eligible member user telephone sets being connected to the private communication network through a wireless communications system, said method comprising the steps of:

establishing a telephone connection between a network call manager and each of a plurality of telephone channels of said switched telephone network, each of said plurality of telephone channels being associated with one of said plurality of eligible member user telephone sets;

providing an information signal received at said network call manager over a selected one of said plurality of telephone channels from an active one of said eligible member user telephone sets simultaneously to a plurality of other ones of said eligible member user telephone sets over other ones of said plurality of telephone channels;

generating talk request signals substantially simultaneously at a plurality of said eligible member telephone sets for transmission to said network call manager via said switched telephone network; and

choosing said active eligible member user telephone set on the basis of said talk request signals received at said network call manager.

17. (Original) The method of claim 16 further including the step of identifying said selected telephone channel by choosing among ones of said talk request signals received over corresponding ones of said plurality of telephone channels.

18. (Original) The method of claim 16 further including the steps of digitally processing information from said active member user in order to produce a sequence of vocoder data packets for modem transmission to said network call manager.

19. (Original) The method of claim 16 further including the step of coupling said information signal from said active member user through a wireless communication network to said selected one of said plurality of telephone channels.

20. (Original) The method of claim 16 further including the steps of:
encrypting information signals generated within the one of said plurality of telephone sets associated with said active member user;
transmitting the encrypted information signals to said network call manager; and
decrypting the encrypted information signals received from said network call manager at the ones of said plurality of telephone sets associated with said other ones of said member users.

21. (Original) In a communication system in which users communicate through a switched telephone network, a private communication network for facilitating communication among a plurality of member user telephone sets, said private communication network comprising:

a network call manager including:

a telephone network interface for establishing a telephone connection with each of a plurality of telephone lines of said switched telephone network, each of said plurality of telephone lines being associated with one of said plurality of member user telephone sets,

a switch matrix, coupled to said telephone network interface, for providing an information signal received over a selected one of said plurality of telephone lines simultaneously to other ones of said plurality of telephone lines via said telephone network interface, and

controller means for configuring said switch matrix in response to talk request signals received over said plurality of telephone lines; and

a plurality of eligible member user telephone sets, at least some of said eligible member user telephone sets being connected to the private communication network through a wireless communications system, disposed for simultaneous communication over said plurality of telephone lines, each of said eligible member user telephone sets including means for generating one of said talk request signals.

22. (Original) The private communication network of claim 21 wherein said controller means including means for identifying said selected telephone line by choosing among ones of said talk request signals received over corresponding ones of said plurality of telephone lines.

23. (Original) In a wireless communication system, a method comprising:
transmitting a data frame;
transmitting a push-to-talk frame subsequent to the data frame; and
transmitting a second data frame subsequent to the push-to-talk data frame.

24. (Original) The method as in claim 23, wherein the push-to-talk frame initiates a push-to-talk communication.

25. (Original) The method as in claim 24, wherein the second data frame is directed to a private network.

26. (Original) The method as in claim 23, further comprising:
identifying the second data frame as a push-to-talk frame for communication in the private network.

27. (Original) The method as in claim 23, wherein the second data frame is part of an encrypted message, the method further comprising:
identifying a packet boundary of the encrypted message.

28. (Currently Amended) A program embodied on a computer-readable medium containing computer-executable instructions to transmit a data signal structure embodied on a carrier wave, comprising:

a first set of instructions for transmitting ~~generating~~ a first vocoder data packet;
a second set of instructions for transmitting generating a push-to-talk packet subsequent to the first vocoder packet; and
a third set of instructions for transmitting ~~generating~~ a second vocoder data packet.

29. (Original) A mobile station capable of voice communications through a wireless communication network, comprising:

a switch operative to generate push-to-talk signals;
a processor coupled to the switch, operative to generate a push-to-talk data packet based on at least one of said push-to-talk signals; and
a transmitter coupled to the processor operative to send the push-to-talk data packet to the wireless communication network.

30. (Original). The mobile station as in claim 29, further comprising:

a second switch coupled to the transmitter, the second switch operative to select between normal operation and push-to-talk operation.

31. (Original) The mobile station as in claim 29, wherein the processor is further operative to generate push-to-talk requests.

32. (Currently Amended). The mobile station as in claim 29 ~~[[31]]~~, wherein the mobile station is associated with a user that is a member of a push-to-talk private network and the private network is identified by an access number; and

wherein the processor is further operative to generate authentication information for confirming membership in the a private network.

33. (Original) The mobile station as in claim 29, further comprising:

encryption means for encrypting data packets for transmission to the private network via the wireless communication network.

34. (Currently Amended) The mobile station as in claim 29, wherein the processor ~~mobile station~~ is further operative to interleave ~~generate~~ push-to-talk data packets ~~interleaved~~ with data packets.

35. (Currently Amended) The mobile station as in claim 34, further comprising:

a vocoder ~~means~~ for converting voice data into said ~~compressed voice~~ data packets ~~for transmission from the mobile station~~.

36. (Currently Amended) A method for private network communications, comprising:

 sending a push-to-talk request for initiating a push-to-talk communication in a private network, wherein the private network is accessed via a public switching telephone network; and

 transmitting a ~~push-to-talk~~ data packet to at least one other user in the private network.

37. (Cancelled)

38. (Cancelled)

39. (Cancelled)

40. (Original). In a wireless communication system, a network call manager, comprising:

 a network controller operative to process and route data packets transmitted within the wireless communication system; and

 a push-to-talk controller operative to process and route push-to-talk requests and private network data packets.

41. (Original). The network call manager as in claim 40, wherein the push-to-talk controller stores at least one access number associated with a first private network.

42. (Cancelled)

43. (Original) The network manager as in claim 40, wherein the push-to-talk controller is operative to receive more than one push-to-talk communications, wherein push-to-talk communications are processed according to an associated priority of each push-to-talk communication.

44. (Original) A wireless communication system, comprising:
a network call manager for facilitating private communications simultaneously among a plurality of mobile users, at least some of said plurality of mobile users being members of a private network, the network call manager comprising:
means for receiving a point-to-point transmission comprising a plurality of voice data packets and a point-to-multipoint transmission comprising a plurality of private network data packets;
means for directing point-to-point transmissions;
means for receiving a request for a point-to-multipoint transmission to the private network;
means for directing the point-to-multipoint data packets to the private network in response to the request; and
a private network of mobile stations operative to transmit point-to-point transmissions and point-to-multipoint transmissions.

45. (New) An apparatus for enabling push-to-talk (PTT) communications, comprising:
means for generating vocoder frames;
means for generating a push-to-talk (PTT) frame;
means for interleaving the PTT frame with the vocoder frames to generate a combined data stream; and
means for transmitting the combined data stream over a wireless communication channel.

46. (New) The apparatus of claim 45, further comprising means for encrypting the vocoder frames.

47. (New) The apparatus of claim 45, further comprising means for generating authentication information for confirming membership in a private communication network.

48. (New) The apparatus of claim 45 further comprising:

means for receiving information associated with a private communication network;
and

means for presenting the information associated with the private communication network to a user.

49. (New) The apparatus of claim 48, wherein the information associated with the private communication network comprises an identification of an active member of the private communication network.

50. (New) The apparatus of claim 48, wherein the information associated with the private communication network comprises an identification of members of the private communication network.

51. (New) A network call manager for enabling push-to-talk (PTT) communications to a private communication network, comprising:

an interface to a public switched telephone network for receiving interleaved vocoder frames and PTT frames from a first member user;

a switch for providing the received vocoder frames to at least a second member user and a third member user; and

a PTT controller for configuring the switch based on a PTT request contained in one or more of said PTT frames.

52. (New) The network call manager of claim 51, wherein said PTT controller is further for establishing individual forward links with said second member user and said third member user, respectively, through said interface.

53. (New) The network call manager of claim 51 further comprising a network controller for paging said second member user and said third member user after said PTT request is received.

54. (New) The network call manager of claim 51, wherein the interface comprises: a data interface connected to a public switched telephone network; and

a modem connected to the data interface, the network controller, the switch, and the PTT controller.

55. (New) The network call manager of claim 51, wherein the interface comprises:
a data interface connected to a public switched telephone network; and
a tone detector connected to the data interface, the network controller, the switch,
and the PTT controller.

56. (New) The network call manager of claim 53, wherein the network controller is
further for sending a list of current participating member users in a PTT communication to
said first member user, said second member user, and to said third member user.

57. (New) The network call manager of claim 53, wherein the network controller is
further for sending an identification of a currently active member user to said second
member user and to said third member user.

58. (New) The network call manager of claim 51, further comprising a queue for
storing a second PTT request from the second member user, the second member user being
granted a speaking privilege after the speaking privilege is no longer held by the first
member user.

59. (New) The network call manager of claim 51, wherein the network controller is
further for authenticating a member user to the private communication network.

60. (New) A signal-bearing medium tangibly embodying a program of machine-
readable instructions executable by a digital processing apparatus to perform a method for
enabling push-to-talk (PTT) communications, the method comprising operations of:

generating vocoder frames;
generating at least one PTT frame;
interleaving the at least one PTT frame with the vocoder frames; and
transmitting the interleaved at least one PTT frame and the vocoder frames over a
wireless communication channel.

61. (New) The signal-bearing medium of claim 60 further comprising operations of encrypting at least the vocoder frames prior to transmission.

62. (New) The signal-bearing medium of claim 60, further comprising operations of generating authentication information for confirming membership in a PTT network.

63. (New) The signal-bearing medium of claim 60, further comprising operations of:
receiving information associated with a PTT network; and
displaying the information associated with the PTT network to a user.

64. (New) The signal-bearing medium of claim 63, wherein the information associated with the PTT network comprises an identification of an active member of the PTT network.

65. (New) The signal-bearing medium of claim 63, wherein the information associated with the PTT network comprises an identification of members of the PTT.

66. (New) A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method for enabling push-to-talk (PTT) communications, the method comprising operations of:
receiving at least one PTT frame and vocoder frames from a member of a PTT communication network through a public switched telephone network;
granting a speaker privilege to the member in response to a PTT request contained within the at least one PTT frame;
establishing at least one forward communication link with the at least two other members of the PTT communication network; and
providing the data frames from the member to the at least two other members of the PTT communication network through the at least one forward communication link.

67. (New) The signal-bearing medium of claim 66 wherein the operation of providing the vocoder frames from the member to the at least two other members of the PTT communication network comprise the operation of configuring a switch to route the vocoder frames to at least two other members of the PTT communication network.

68. (New) The signal-bearing medium of claim 66 further comprising the operation of authenticating the member prior to granting the speaker privilege.

69. (New) The signal-bearing medium of claim 66 further comprising the operation of sending a list of active members in the PTT communication network to the at least two other members.

70. (New) The signal-bearing medium of claim 66 further comprising operations of: storing a second PTT request from a second member; and granting the speaker privilege to the second member after the speaking privilege is no longer held by the first member user.

71. (New) A method for enabling push-to-talk (PTT) communications, the method comprising:

generating vocoder frames;
generating at least one PTT frame;
interleaving the at least one PTT frame with the vocoder frames; and
transmitting the interleaved at least one PTT frame and the vocoder frames over a wireless communication channel.

72. (New) The method of claim 71 further comprising operations of encrypting at least the vocoder frames prior to transmission.

73. (New) The method of claim 71, further comprising generating authentication information for confirming membership in a PTT network.

74. (New) The method of claim 71, further comprising:
receiving information associated with a PTT network; and
displaying the information associated with the PTT network to a user.

75. (New) The method of claim 74, wherein the information associated with the PTT network comprises an identification of an active member of the PTT network.

76. (New) The method of claim 74, wherein the information associated with the PTT network comprises an identification of members of the PTT.

77. (New) A method for enabling push-to-talk (PTT) communications, the method comprising:

receiving at least one PTT frame and vocoder frames from a member of a PTT communication network through a public switched telephone network;

granting a speaker privilege to the member in response to a PTT request contained within the at least one PTT frame;

establishing at least one forward communication link with the at least two other members of the PTT communication network; and

providing the data frames from the member to the at least two other members of the PTT communication network through the at least one forward communication link.

78. (New) The method of claim 77 wherein providing the vocoder frames from the member to the at least two other members of the PTT communication network comprise configuring a switch to route the vocoder frames to at least two other members of the PTT communication network.

79. (New) The method of claim 77 further comprising authenticating the member prior to granting the speaker privilege.

80. (New) The method of claim 77 further comprising sending a list of active members in the PTT communication network to the at least two other members.

81. (New) The method of claim 77 further comprising:
storing a second PTT request from a second member; and
granting the speaker privilege to the second member after the speaking privilege is no longer held by the first member user.